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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/002,616	12/05/2001	Paul Smith	P 284196 PE WEAR	1946
909	7590	10/21/2003		
PILLSBURY WINTHROP, LLP P.O. BOX 10500 MCLEAN, VA 22102			EXAMINER LU, C CAIXIA	
			ART UNIT	PAPER NUMBER
			1713	

DATE MAILED: 10/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/002,616	Applicant(s) SMITH ET AL.	
	Examiner Caixia Lu	Art Unit 1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6,8-18 and 20-35 is/are pending in the application.
- 4a) Of the above claim(s) 20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-6,8 and 10-18 is/are rejected.
- 7) ☒ Claim(s) 9 is/are objected to.
- 8) ☒ Claim(s) 20 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: |

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-19 and 21-36, drawn to a ethylene polymer, classified in class 526, subclass 348.
 - II. Claim 20, drawn to a sliding member comprising a ethylene polymer, classified in class 526, subclass 352.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as mutually exclusive species in an intermediate-final product relationship. Distinctness is proven for claims in this relationship if the intermediate product is useful to make other than the final product (MPEP § 806.04(b), 3rd paragraph), and the species are patentably distinct (MPEP § 806.04(h)). In the instant case, the intermediate product is deemed to be useful as film making material and the inventions are deemed patentably distinct since there is nothing on this record to show them to be obvious variants. Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions anticipated by the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
4. Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.
5. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.
6. During a telephone conversation with Attorney Paul Sharer on October 6, 2003 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-19 and 21-35. Affirmation of this election must be made by applicant in replying to this Office action. Claim 20 is withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.
7. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 102/103

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1, 4-5, 8, and 10, 12, 13 and 15-18 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Jacobsen et al. (US 5,834,393).

The instant claims are directed to an ethylene polymer with average Mw in the range of 150,000-1,000,000 g/mol, Mn of least 25,000 g/mol, and Mw/Mn in the range of 1.3-10, wherein the ethylene polymer comprises comonomer and the amount of comonomer is up to 4 wt.%.

Jacobsen teaches the preparation of olefin copolymers having weight average molecular weights in the preferred range of 100,000 to 1,000,000, and Mw/Mn in the preferred range of 2.0 to 8.0 (col. 23, line 57 to col. 24, line 6).

Jacobsen's Example 28 teaches the preparation of ethylene-butene copolymer with butene content of 1.42 mol% (about 2.8 wt.%), and melt flow index of 0.85 g/10 minutes. The prior art examples do not disclose all the claimed limitations such as the average weight molecular weight, and Mw/Mn. A skilled artisan would have expected Jacobsen's Mw/Mn of Example 28 to be in the range of 2.0 to 8.0 because patentee teaches the Mw/Mn of the copolymer prepared by patentee's process are within those

range. A skilled artisan also understand that the melt flow index is related to molecular weight of the polymer and expect the weight average molecular weight of patentee's polymer to be in the range of the instant claims based on patentee's rather low melt flow index of 0.85 g/10 minutes.

Once a product appearing to be substantially identical is found and a 35 USC 102/103 rejection made, the burden of proof is shifted to the applicant to show an unobvious difference. In re Fitzgerald, 205 USPQ 594. In re Fessmann, 180 USPQ 324. Applicants have not met their burden to demonstrate an unobvious difference between the claimed product and the products of the prior art examples.

Even if the claimed properties are not inherent in the polymers of the prior art examples, it would still have been obvious for a skilled artisan to arrive at the claimed subject matter because it appears that the claimed subject matter is within the generic disclosure of the prior art and expected to work. For example, if the molecular weight of the copolymer of Jacobsen's Example 28 is below the range of the instant claims, one would have motivated to use less hydrogen in the polymerization process of Jacobsen's Example 28 to prepare an ethylene copolymer with higher molecular weight in order to provide a ethylene copolymer with enhance mechanical strength.

11. Claims 1, 4-5, 8, and 10, 12, 13 and 15-18 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Jacobsen et al. (US 5,834,393).

Jacobsen's Example 1 of col. 41 teaches an ethylene-butene copolymer with Mw of 152,000, Mw/Mn of 4.5. Jacobsen does not express disclose the butene repeating

unit wt.% in the copolymer of Example 1. However, the butene/ethylene ratio of 20/700 used during the polymerization is smaller than the butene/ethylene ratio of 42.5/800 of Example 28 of US 5,834,393 where the butene incorporation in the copolymer is 1.42 mol.% (about 2.8 wt.%), thus, one would have expected the butene repeating unit content in the copolymer of Jacobsen's Example 1 to be less than that of Example 28 of US 5,834,393 since less butene based on total amount of ethylene is used during the polymerization in Example 1 compared to that of Example 28.

Once a product appearing to be substantially identical is found and a 35 USC 102/103 rejection made, the burden of proof is shifted to the applicant to show an unobvious difference. In re Fitzgerald, 205 USPQ 594. In re Fessmann, 180 USPQ 324. Applicants have not met their burden to demonstrate an unobvious difference between the claimed product and the products of the prior art examples.

12. Claims 2, 6, 11 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobsen et al. (US 5,834,393) and Jacobsen et al. (US 5,834,393).

The instant claims further limit the ethylene copolymer to have a molecular weight of at least 250,000 g/mol, Mw/Mn in the range of 2-4, number average molecular weight of at least 100,000 g/mol and wear coefficient of less than $2.9 \times 10^{-4} \text{ mm}^3/\text{mN}$.

Jacobsen's teaching of US 5,834,393) is relied upon as shown above. Although the working example does not meet all of the limitations, those limitations are within the scope of Jacobsen's teaching. It is commonly known at the time of the invention that the mechanical strength of a polyolefin increases as the molecular weight of the polymer increases and the molecular weight distribution decreases. For example, when

the molecular weight control agent hydrogen is not used in the polymerization process, ethylene copolymer with molecular weight at high end of the range of 100,000 to 1,000,000 g/mol will be obtained, and the polyethylene with ultrahigh molecular weight are expected to have wear coefficient of less than $2.9 \times 10^{-4} \text{mm}^3/\text{mN}$ and, thus, meet the limitation of the instant Claim 2. Polyethylenes with ultrahigh molecular weights having wear coefficients of less than $2.9 \times 10^{-4} \text{mm}^3/\text{mN}$ are demonstrated in applicant's comparative examples as listed in Table I of page 16 of the Specification.

Thus, it would have been obvious to a skilled artisan at the time the invention was made to employ Jacobsen's teaching to prepared a polyethylene with higher molecular weight and narrower molecular weight distribution in order to improve the mechanical strength of the polymer and in the absence of showing criticality and unexpected result.

Similar rejection are made over Jacobsen et al. (US 5,834,393), see col. 11, lines 5-39.

Allowable Subject Matter

13. Claims 9 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.

14. Claims 3 and 21-35 are allowed for the same reason as indicated in the previous office action, Paper No. 8.

Conclusion

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP


§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Caixia Lu whose telephone number is (703) 306-3434. The examiner can normally be reached on 9:00 a.m. to 3:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on (703) 308-2450. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1193.


Caixia Lu, Ph. D.
Primary Examiner
Art Unit 1713